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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,846	01/30/2004	Mailvaganam Mahendran	4320-529	4139

1059 7590 01/03/2005

BERESKIN AND PARR  
SCOTIA PLAZA  
40 KING STREET WEST-SUITE 4000 BOX 401  
TORONTO, ON M5H 3Y2  
CANADA

EXAMINER

FORTUNA, ANA M

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 01/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/766,846

Applicant(s)

MAHENDRAN ET AL.

Examiner

Ana M Fortuna

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 109 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/16/04, 11/03/04, 7/19/04
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP patent publication 07-289860 (hereinafter '860) in view of Pye (3,554,379)(hereinafter '379) and Mahon (3,228,876)(hereinafter '876). Reference '860 discloses the apparatus including elements a, b, d, e) of claim 1 (Fig. 1, elements 8, 2, 10, 4, 7, 9), the potting material forming holding the ends of the membranes or sealing the permeate from the retentate is discussed, e.g. sealing with adhesive (pages 8-9, section 0027 of translation). Reference '860 fails to disclose elements claimed in c) of claim 1, or the fibers protruding from the potting area or potting material. Patent '379 teach forming a membrane module potting the hollow fibers with a potting material and the fibers protruding from the potting material and open at their ends (Figure 1, elements 14, 12, 19). The hollow fiber module is disclosed to be made by the process of Mahon(column 6, lines 35-75, and column 7, lines 1-35). Mahon (patent '876) teach a hollow fiber module including hollow fibers bonded to a potting material without penetrating the potting material inside the hollow fiber, protruding ends of the hollow fibers through the bonding resin, e.g. by inserting a substance into

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the ends of the hollow fibers and removing after potting (Fig. 6, column 7, lines 33-60, column 8, lines 49-60).

It would have been obvious to one skilled in the art at the time the invention was made to have a hollow fiber membrane module with the hollow fibers protruding through the potting material and open at their ends, as suggested by '379, and '876, e.g. for easy manufacturing of the module, and to avoid fiber damage cause by cutting plugged ends, as discussed in '876.

Regarding claim 2, the permeate pan or end cap is defined in '860 as element (2), see description of drawings (Fig.1).

As to claim 5, the permeate collection zone is identified in 'reference '860 as section 7, however, the lower cap can also be considered a permeate collection zone, when fibers are open at the lower end cap. The lower end cap in reference '860 includes a permeate inlet zone defined by pipe (4), in an optionally permeate removal zone.

Open the hollow fiber at both ends is suggested in reference "379.

As to claims 6-9, the air tube passing through the potting material. Regarding the optional manifold, element 4 inherently contains a manifold, e.g. a connection to an air supply source.

3. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP patent publication 07-289860 (hereinafter '860) in view of Pye (3,554,379)(hereinafter '379) and Mahon (3,228,876)(hereinafter '876) as applied to claim 1 above, and further in view of JP 03131324)(hereinafter '324) and JP 04317725 (hereinafter '725).

Reference '860, '379, '876 teach various potting materials including silicone rubber,

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however, a combination of potting resin and a further cushioning lamina is not disclosed. Reference ' 725 is cumulative as teaching degree of elasticity 10-1000 kg/cm<sup>2</sup> of silicone use in potting material (abstract)

Reference '324 teaches potting hollow fibers at their ends portions with a potting material, and depositing an elastomer layer (cushioning layer), made of silicone material, having uniform thickness in adjacent relation to the potting material (abstract).

Reference ' 725 is cumulative as teaching degree of elasticity 10-1000 kg/cm<sup>2</sup> of silicone use in potting material (abstract). It would have been obvious to one skilled in the art at the time the invention was made to provide a silicone lamina to a potting material, as suggested by '324 to avoid dead spaces between the membranes and the potting material and to improve pressure resistance (abstract). Selecting silicone with an optimum degree of elasticity (or lower hardness) is suggested by '725, as discussed above.

### ***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

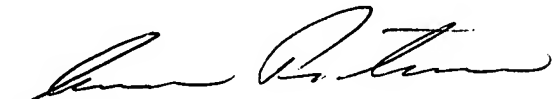
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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana M Fortuna whose telephone number is (571) 272-1141. The examiner can normally be reached on 9:30-6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on (571) 272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ana M Fortuna  
Primary Examiner  
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AF

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December 23, 2004